

REMARKS

I. Status of Claims

Claims 21, 23-35, and 37-41 are pending.

Applicants have amended claims 21, 35, 37, 39, and 40, and have cancelled claims 22 and 36 without prejudice or disclaimer of the subject matter thereof.

Applicants submit that the amendments are supported by the specification and do not introduce new matter.

Applicants thank the Examiner for withdrawing the rejection over U.S. Patent No. 6,354,087.

II. Rejections Under 35 U.S.C. §102

The Examiner rejected claims 21-32, 34-37, and 40-41 under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 3,646,243 to Graneau et al. (hereinafter referred to as *Graneau*) for the reasons listed at pages 2-7 of the non-Final Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below.

In order to anticipate a claim, a reference must teach every element and limitation of the claim. See M.P.E.P. § 2131. Applicants respectfully submit that *Graneau* fails to expressly or inherently disclose or teach at least one element of the presently claimed invention, namely a storage unit having "a predetermined volume adapted to contain a quantity of said third refrigerating fluid at said predetermined temperature, corresponding to the thermal consumption of said superconducting

cable for at least two hours in the absence of heat exchange with said second refrigerating fluid," as required by all of the rejected claims.

Claim 21 recites a system for transporting electric energy in superconductivity conditions that includes this element, and claim 35 recites a cryogenic plant that includes this element. Similarly, claim 40 recites a method for continuously cooling a superconducting cable that includes this element. Each of the remaining claims are dependent on one of these three claims.

According to the Examiner, *Graneau* discloses that the "storage unit (25) has a predetermined volume adapted to contain a quantity of said third refrigerating fluid (cooled liquefied helium) corresponding to the thermal consumption of said superconducting cable (10 & 11) for at least two hours in the absence of a heat exchange with said second refrigerating fluid (neon gas, Col 5 lines 58-70)." Office action, pages 3 and 6. Applicants respectfully disagree that the cited portion of *Graneau* discloses this element of the claimed invention.

Applicants' claims are directed to defining the volume of the storage tank such that if the second refrigerating fluid was no longer cooling the tank (for whatever reason, such as shutdown for repair), then the tank would have enough heat capacity due to its volume to continue to meet the consumption requirements of the superconducting cables for at least two hours. Accordingly, the volume is designed as a safety feature.

In contrast, the cited portion of *Graneau* states:

Sooner or later, the load will dip below full load level.
Such periods in which the cooling capacity required in circuits
10 and 11 is less than the capability of cryogenerator 26 must

be used to subcool the stored liquid nitrogen in tank 25. At this point, i.e. when the temperature of liquid nitrogen in line 21 falls below 75° K, valve 58 is operated to divert some or all neon refrigerant from line 57 through coil 33 until the temperature in tank 25 decreases to about 75° K. At that point, valve 56 is operated, as the loading conditions on cable 10 and 11 permit, to pass some or all of the neon refrigerant in line 46 from cryogenerator 26 directly to coil 33 in tank 25.

Col. 5, lines 58-68. Clearly this portion of *Graneau* fails to disclose a storage unit with “a predetermined volume . . . corresponding to the thermal consumption of [the] superconducting cables” Nothing in the cited portion of *Graneau* would direct a person of ordinary skill in the art to develop such a feature with respect to tank 25.

The cited portion merely teaches that when the cryogenerator 26 has greater capacity than the superconducting cables 10, 11 can consume, then valve 58 diverts excess refrigerant (i.e., the second refrigerating fluid) into tank 25. In other words, the second refrigerating fluid is being diverted to cool the tank, which is not the situation recited in Applicants’ claims. Given such a significant factual difference, it is not apparent how a person of ordinary skill in the art would know how to calculate Applicants’ recited volume. Further, Applicants submit that the cited portion of *Graneau* does not provide any direction whatsoever regarding the volume of the tank.

Moreover, Applicants submit that there is nothing in the entirety of *Graneau* to teach or suggest to a person of ordinary skill in the art that *Graneau*’s tank 25 has a volume “adapted to contain a quantity of said third refrigerating fluid corresponding to the thermal consumption of said superconducting cable for at least two hours in

the absence of a heat exchange with said second refrigerating fluid.” There is simply no recognition of all of these conditions to make that calculation.

Therefore *Graneau* fails to expressly disclose or teach every element of the claimed invention, and the Examiner cannot rely on *Graneau* as an anticipating reference under 35 U.S.C. § 102.

For the foregoing reasons, Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. §102(b).

III. Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 33, 38, and 39 under 35 U.S.C. § 103(a). Specifically, the Examiner rejected claim 33 as being obvious over *Graneau* in view of U.S. Patent No. 3,932,158 to Hildebrant, and rejected claims 38 and 39 as being obvious over *Graneau* alone for the reasons described at pages 7-9 of the Office Action. Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness.

To establish a *prima facie* case of obviousness, the Examiner bears the burden of meeting three criteria. The Examiner must establish that: (1) there is some suggestion or motivation to modify the reference or to combine the reference teachings; (2) there is a reasonable expectation of success for the modification; and (3) the prior art suggests or teaches all of the claimed limitations. M.P.E.P. § 2143. With regard to the present application, the Examiner has at least failed to show that the prior art suggests or teaches all of the claimed limitations and that there is some motivation to modify or combine the prior art.

A. The prior art does not teach all claim limitations

As discussed above, and incorporated by reference herein, *Graneau* fails to expressly disclose or teach at least one element of the presently claimed invention, namely a storage unit having a predetermined volume adapted to contain a quantity of the third refrigerating fluid corresponding to the thermal consumption of the superconducting cable for at least two hours in the absence of a heat exchange with the second refrigerating fluid. Further, *Hildebrant* fails to make any such disclosure, and, thus, does not correct this deficiency of *Graneau*. Regarding claims 38 and 39, the Examiner admits that *Graneau* does not necessarily disclose the actual volumes claimed in the present application. Office action, page 9.

Thus the prior art does not teach all of the claim limitations, and the examiner has failed to establish a *prima facie* case of obviousness.

B. There is no motivation to modify the prior art

Since the references do not expressly or inherently disclose all claim limitations, the Examiner bears the burden to show a motivation to combine or modify the references. M.P.E.P. § 2143.01. Here, the Examiner asserts that it would have been obvious to modify the storage tank of *Graneau* “since the applicant has not disclosed that such a modification solves any stated problems or is for any particular purpose” *Id.* Since this argument is factually and legally irrelevant, Applicants respectfully disagree.

It is well established that “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.” M.P.E.P. § 2143.03 (citing *In re*

Wilson, 424 F.2d 1382, 1385; 165 U.S.P.Q. 494, 496 (CCPA 1970)). Nonetheless, Applicants note that there is an abundance of evidence regarding the purpose of the missing claim limitation. The language in claims 21, 35, and 40 identifies the particular purpose of the predetermined volume of the storage tank, namely to allow the third refrigerating fluid to remain below a predetermined temperature for a specified amount of time in the absence of heat exchange with the second refrigerating fluid. Additional evidence appears in the specification, which discusses that maintaining the temperature of the third refrigerating fluid in this situation ensures “an autonomy of operation of the cryogenic system for a limited time so as to repair possible failures or carry out ordinary or extraordinary maintenance of its components.” Specification, page 3, line 30 – page 4, line 3. Therefore, the purpose of the limitation of the claimed invention is to maintain the superconductive material below its critical temperature even during times when there is no heat exchange between the first and second refrigerating fluids. *Id.* at page 10, lines 15-20. Thus, despite the Examiner’s assertion, Applicants have indeed stated the purpose of the predetermined volume of the storage tank.

The Examiner also asserts that modifying the *Graneau* reference “would have involved a mere change in size of a component and a change in size is generally recognized as being within the ordinary skill of the art.” Office action, page 9. Again, the Examiner’s argument is legally and factually wrong.

First, this is not simply an obvious change in size. When dealing with changes in a variable of a claimed invention, the variable “must first be recognized as a result-effective variable . . . before the determination of the optimum or

workable ranges of said variable might be recognized as routine experimentation.” M.P.E.P. § 2144.05 (citing *In re Antonie*, 559 F.2d 618; 195 U.S.P.Q. 6 (CCPA 1977)). While the prior art may disclose storage tanks with some unknown volume, the prior art does not recognize the volume of the storage tank as a variable which would achieve a recognized result. Further, the prior art does not recognize the value where there is an absence of heat exchange with the second refrigerating fluid. Applicants were the first to recognize the volume of the storage tank as an important variable, and to discover the relationship between the volume of the storage tank and the thermal consumption of the superconducting cable for a specified amount of time. See *id.* Thus, it could not have been obvious to one of ordinary skill in the art to modify *Graneau* to obtain the present invention.

Second, the Examiner has offered no factual evidence that such a change is within the ordinary skill in the art. *In re Zurko*, 59 U.S.P.Q.2d 1693 (Fed. Cir. 2001). The M.P.E.P. states that the mere fact that the invention is within the capabilities of one of ordinary skill in the art is “not sufficient to establish a *prima facie* case of obviousness. . . .” M.P.E.P. § 2143.01. The Examiner is required to provide a motivation to combine the prior art to make the claimed invention. If the standard were as recited by the Examiner, then all inventions would be obvious.

Having failed to provide any evidence that (1) the prior art contains all the claimed limitations, and (2) that there is some motivation to combine or modify the prior art references, Applicants assert that the Examiner has not established a *prima facie* case for obviousness. Accordingly, Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. §103(a).

IV. Conclusion

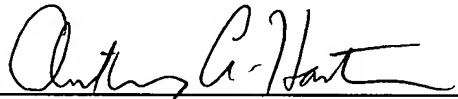
In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: March 29, 2004

By: 
Anthony A. Hartmann
Reg. No.: 43,662